Curriculum Long Term Planning Overview	Key Stage 3	Subject Area: Maths	

Year	Study Modules	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Year 7 Set 2	**Study Modules**	**Number 1 and Calculating** • Calculate with positive indices (roots) using written methods • Calculate with negative indices in the context of standard form • Know the multiplication, division, power and zero law of indices • Know the negative and fractional law of indices • Use a calculator to evaluate numerical expressions involving powers (roots) • Interpret a number written in standard form • Add (subtract) numbers written in standard form • Multiply (divide) numbers written in standard form • Convert a 'near miss' into standard form; e.g. 23×10^7 • Enter a calculation written in standard form into a scientific calculator • Interpret the standard form display of a scientific calculator • Understand the difference between truncating and rounding • Identify the minimum and maximum values of	**Algebraic Manipulation 1** • Know how to write products algebraically • Use fractions when working in algebraic situations • Simplify an expression involving terms with combinations of variable sand and collecting like terms (e.g. $3a^2b + 4ab^2 + 2a^2 – a^2b$) • Identify common factors (numerical and algebraic) of terms in an expression • Factorise an expression by taking out common factors • Simplify an expression involving terms with combinations of variables (e.g. $3a^2b + 4ab^2 + 2a^2 – a^2b$) • Know the multiplication, division, power and zero law of indices • Understand that negative powers can arise • Substitute positive and negative numbers into formulae • Be aware of common scientific formulae • Know the meaning of the 'subject' of a formula	**Exploring FDP and Calculating with FDP** • Apply addition and subtraction to proper fractions and improper fractions • Apply addition and subtraction to mixed numbers • Multiply proper and improper fractions • Multiply mixed numbers • Divide a proper fraction by a proper fraction • Apply division to improper fractions and mixed numbers • Apply the four operations to simplifying algebraic fractions • Use calculators to find a percentage of an amount using multiplicative methods • Identify the multiplier for a percentage increase or decrease • Know how to find an amount after an investment with simple interest • Use calculators to increase (decrease) an amount by a percentage using multiplicative methods • Compare two quantities using percentages	**Proportional Reasoning** • Know the difference between direct and inverse proportion • Recognise direct proportion in a situation • Know the features of a graph that represents a direct proportion situation • Recognise inverse proportion in a situation • Know the features of a graph that represents an inverse proportion situation • Know the features of an expression, or formula, that represents a direct proportion situation • Know the features of an expression, or formula, that represents an inverse proportion situation • Understand the connection between the multiplier, the expression and the graph • Solve problems involving direct and inverse proportions • Identify congruence of shapes in a range of situations • Identify similarity of shapes in a range of situations	**Algebraic Manipulation 2, Formulae and Solving Equations I** • Understand the meaning of an identity • Multiply two linear expressions of the form $(x + a)(x + b)$ • Multiply two linear expressions of the form $(x \pm a)(x \pm b)$ • Expand the expression $(x \pm a)^2$ • Simplify an expression involving 'x^2' by collecting like terms • Identify when it is necessary to remove factors to factorise a quadratic expression • Identify when it is necessary to find two linear expressions to factorise a quadratic expression • Factorise a quadratic expression of the form $x^2 + bx + c$ • Know how to set up an mathematical argument • Work out why two algebraic expressions are equivalent • Create a mathematical argument to show that two algebraic expressions are equivalent • Identify variables in a situation	**Investigating angles** • Identify alternate angles and know that they are equal • Identify corresponding angles and know that they are equal • Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams • Establish the fact that angles in a triangle must total 180° (link to solving algebraic equations) • Solve missing angle problems involving alternate angles (link to algebraic problems) • Solve missing angle problems involving corresponding angles (link to algebraic problems) • Use the fact that angles in a triangle total 180° to work out the total of the angles in any polygon • Establish the size of an interior angle in a regular polygon • Know the total of the exterior angles in any polygon • Establish the size of an exterior angle in a regular polygon Solve missing angle

		an amount that has been rounded (to nearest x, x d.p., x s.f.) • Use inequalities to describe the range of values for a rounded value • Solve problems involving the maximum and minimum values of an amount that has been rounded	• Change the subject of a formula when one step is required • Change the subject of a formula when a two steps are required	• Know that percentage change = actual change ÷ original amount • Calculate the percentage change in a given situation, including percentage increase / decrease	• Finding missing lengths in similar shapes • Solve problems involving compound units, such as density, pressure, population density and speed Convert between compound units of density and speed **Sequences 1** • Generate a sequence from a term-to-term rule • Understand the meaning of a position-to-term rule • Use a position-to-term rule to generate a sequence • Find the position-to-term rule for a given sequence • Use algebra to describe the position-to-term rule of a linear sequence (the nth term) • Use the nth term of a sequence to deduce if a given number is in a sequence • Generate a sequence using a spreadsheet	• Distinguish between situations that can be modelled by an expression or a formula • Create an expression or a formula to describe a situation • Building equations • Identify the correct order of undoing the operations in an equation • Solve linear equations with the unknown on one side when the solution is a negative number • Solve linear equations with the unknown on both sides when the solution is a whole number • Solve linear equations with the unknown on both sides when the solution is a fraction • Solve linear equations with the unknown on both sides when the solution is a negative number • Solve linear equations with the unknown on both sides when the equation involves brackets • Recognise that the point of intersection of two graphs corresponds to the solution of a connected equation • Check the solution to an equation by substitution	problems in polygons **Constructions 1** • Use compasses to construct clean arcs • Use ruler and compasses to construct the perpendicular bisector of a line segment • Use ruler and compasses to bisect an angle • Use a ruler and compasses to construct a perpendicular to a line from a point (at a point) • Understand the meaning of locus (loci) • Know how to construct the locus of points a fixed distance from a point (from a line) • Identify when to use the locus of points a fixed distance from a point (from a line) • Identify when a perpendicular bisector is needed to solve a loci problem • Identify when an angle bisector is needed to solve a loci problem • Choose techniques to construct 2D shapes; e.g. rhombus • Combine techniques to solve more complex loci problems • Know how to deal with a change in depth when dealing with plans and elevations • Construct a shape from its plans and elevations Construct the plan and

							elevations of a given shape
	Assessment	Open book end of topic assessment	Closed book end of term test	Open book end of topic assessment	Open book end of topic assessment	Open book end of topic assessment	Closed book end of term test

Year	Study Modules	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Year 8 Set 2	**Study Modules**	**Calculating Space** • Calculate the area of a trapezium • Know the vocabulary of circles • Know how to find arc length, including calculating exactly with multiples of π • Calculate the arc length of a sector when radius is given • Know how to find the area of a sector including calculating exactly with multiples of π • Calculate the area of a sector when radius is given • Calculate the angle of a sector when the arc length and radius are known • Calculate the volume and surface area of a right prism (including a cylinder) • Calculate exactly with multiples of π • Know how to find the surface area of a cylinder • Calculate exactly with multiples of π • Know Pythagoras' theorem	**Straight Line Graphs** • Know that graphs of functions of the form y = mx + c, x ± y = c and ax ± by = c are linear • Plot graphs of functions of the form y = mx + c (x ± y = c, ax ± by = c) • Plot graphs of functions of the form ax ± by = c • Draw and recognise the graphs of y = c and x = c • Understand the concept of the gradient of a straight line and when two lines are parallel • Find the equation of a line given a diagram, one point and a given gradient and given two points. • Distinguish between a linear and quadratic graph • Plot graphs of quadratic functions of the form y = x^2 ± c • Sketch a simple quadratic graph • Sketch a simple cubic graph • Plot and interpret graphs of piece-wise linear functions in real contexts	**Solving Equations 3** • Understand that there are an infinite number of solutions to the equation ax + by = c (a ≠ 0, b ≠ 0) • Understand the concept of simultaneous equations • Find approximate solutions to simultaneous equations using a graph • Understand the concept of solving simultaneous equations by elimination* • Target a variable to eliminate • Decide if multiplication of one equation is required • Decide whether addition or subtraction of equations is required • Add or subtract pairs of equations to eliminate a variable • Find the value of one variable in a pair of simple simultaneous equations	**Presentation of Data** • Construct graphs of time series • Interpret graphs of time series • Understand that correlation does not indicate causation • Interpret a scatter diagram using understanding of correlation • Construct a line of best fit on a scatter diagram • Use a line of best fit to estimate values • Know when it is appropriate to use a line of best fit to estimate values • Know the meaning of continuous data • Interpret a grouped frequency table for continuous data • Construct a grouped frequency table for continuous data • Construct histograms for grouped data with equal class intervals • Interpret histograms for grouped data with equal class intervals	**Triangles** • Appreciate that the ratio of corresponding sides in similar triangles is constant • Choose an appropriate trigonometric ratio that can be used in a given situation • Understand that sine, cosine and tangent are functions of an angle • Establish the exact values of sinθ and cosθ for θ = 0°, 30°, 45°, 60° and 90° • Establish the exact value of tanθ for θ = 0°, 30°, 45° and 60° • Use a calculator to find the sine, cosine and tangent of an angle • Know the trigonometric ratios, sinθ = opp/hyp, cosθ = adj/hyp, tanθ = opp/adj • Set up and solve a trigonometric equation to find a missing side in a right-angled triangle • Set up and solve a trigonometric equation when the unknown is in the denominator of a fraction • Set up and solve a trigonometric equation to find a missing angle	**Measuring Data** • Find the modal class of set of grouped discrete data • Find the class containing the median of a set of discrete data • Calculate an estimate of the mean from a grouped discrete frequency table • Estimate the range from a grouped discrete frequency table • Analyse and compare sets of data, appreciating the limitations of different statistics (mean, median, mode, range) Calculate the four averages of a grouped continuous frequency table **Probability** • List all elements in a combination of sets using a Venn diagram • List outcomes of an event systematically • Use a table to list all outcomes of an event • Use frequency trees to record outcomes of

		• Identify the hypotenuse in a right-angled triangle • Know when to apply Pythagoras' theorem • Calculate the hypotenuse of a right-angled triangle using Pythagoras' theorem Calculate one of the shorter sides in a right-angled triangle using Pythagoras' theorem **Straight Line Graphs** • Know that graphs of functions of the form $y = mx + c$, $x \pm y = c$ and $ax \pm by = c$ are linear • Plot graphs of functions of the form $y = mx + c$ ($x \pm y = c$, $ax \pm by = c$) • Plot graphs of functions of the form $ax \pm by = c$ • Draw and recognise the graphs of $y = c$ and $x = c$ • Understand the concept of the gradient of a straight line and when two lines are parallel • Find the equation of a line given a diagram, one point and a given gradient and given two points. • Distinguish between a linear and quadratic graph • Plot graphs of quadratic functions of the form $y = x^2 \pm c$ • Sketch a simple quadratic graph • Sketch a simple cubic graph • Plot and interpret graphs of piece-wise	• Plot and interpret distance-time graphs (speed-time graphs) • Find approximate solutions to kinematic problems involving distance and speed **Solving Equations 2** • Understand the meaning of the four inequality symbols • Choose the correct inequality symbol for a particular situation • Represent practical situations as inequalities • Recognise a simple linear inequality • Find the set of integers that are solutions to an inequality • Use set notation to list a set of integers • Use a formal method to solve an inequality • Use a formal method to solve an inequality with unknowns on both sides • Use a formal method to solve an inequality involving brackets • Know how to deal with negative number terms in an inequality • Know how to show a range of values that solve an inequality on a number line • Know when to use an open circle at the end of a range of values shown on a number line • Know when to use an filled circle at the end	• Find the value of the second variable in a pair of simple simultaneous equations • Solve two linear simultaneous equations in two variables in very simple cases (no multiplication required) • Solve two linear simultaneous equations in two variables in simple cases (multiplication of one equation only required) • Derive and solve two simultaneous equations Interpret the solution to a pair of simultaneous equations	**Number 2** • Estimate squares and cubes of numbers up to 100 • Estimate powers of numbers up to 10 • Estimate square roots of numbers up to 150 and cube roots of numbers up to 20 • Know and use the fact that $a^{-n} = 1/a^n$ • Know and use the fact that $a^{1/n} = \sqrt[n]{a}$ • Calculate exactly with surds • Choose the required minimum and maximum values when solving a problem involving upper and lower bounds Calculate the upper and lower bounds in a given situation	in a right-angled triangle • Use trigonometry to solve problems involving bearings Use trigonometry to solve problems involving an angle of depression or an angle of elevation **Sequences 2** • Recognise Fibonacci numbers • Recognise the Fibonacci sequence • Generate Fibonacci type sequences • Find the next three terms in any Fibonacci type sequence • Substitute numbers into formulae including terms in x^2 • Generate terms of a quadratic sequence from a written rule • Generate terms of a quadratic sequence from its nth term • Identify quadratic sequences • Establish the first and second differences of a quadratic sequence Find the next three terms in any quadratic sequence **Constructions 2** • Identify congruent triangles • Know the criteria for triangles to be congruent (SSS, SAS, ASA, RHS) • Use known facts to form conjectures about lines and angles in geometrical situations	probability experiments • Construct theoretical possibility spaces for combined experiments with equally likely outcomes • Calculate probabilities using a possibility space • Use theoretical probability to calculate expected outcomes Use experimental probability to calculate expected outcomes • Calculate the probabilities of independent combined events • Calculate the probabilities of dependent combined events • List outcomes of combined events using a tree diagram • Label a tree diagram with probabilities • Label a tree diagram with probabilities when events are dependent • Know when to add two or more probabilities • Know when to multiply two or more probabilities • Use a tree diagram to calculate probabilities of independent combined events • Use a tree diagram to calculate probabilities of dependent combined events • Understand that relative frequency tends towards theoretical probability as sample size increases

		linear functions in real contexts • Plot and interpret distance-time graphs (speed-time graphs) • Find approximate solutions to kinematic problems involving distance and speed	of a range of values shown on a number line Use a number line to find the set of values that are true for two inequalities **Transformations** • Translate a shape given a vector • Reflect shapes in the x and y axis, lines x = k, y = k and y = ±x • Rotate a shape about a point, given an angle and direction • Use the centre and scale factor to carry out an enlargement of a 2D shape with a fractional scale factor • Find the scale factor of an enlargement with fractional scale factor • Find the centre of an enlargement with fractional scale factor • Perform a sequence of transformations on a 2D shape • Find and describe a single transformation given two congruent 2D shapes Solve problems involving similarity			• Use known facts to derive further information in geometrical situations • Solve problems, including geometrical proof, involving congruence • Test conjectures using known facts • Know the structure of a simple mathematical proof • Use known facts to create simple proofs • Explain why the base angles in an isosceles triangle must be equal Explain the connections between Pythagorean triples	
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